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Volume 9, Issue 45

year to potentially emit 50 or more tons of VOC annually, the rule requires that the average VOC-content of the raw beads over any 30-day period not exceed 4.6%. In addition, like cup-makers, shape makers must reduce, by 85%, the amount of VOC emitted between the point at which the raw beads are opened and the point at which the molding material is about to enter the molds.

An alternative operating scenario is offered block-makers and shape-makers that allows them to use raw material with no more than 3.0% VOC content instead of using an emission control system, to reduce VOC emissions. Such beads are not yet available but the increased use of low VOC beads with an actual VOC content of 3.3 to 3.6% may lead to the development of beads with a 3.0% VOC content.

An alternative operating scenario is offered cup-makers in lieu of the 1.5 lbs./100 lbs. plus 85% control standards: A limit of ranging from 3.0 to 3.9 lbs. of VOC per 100 lbs. of raw material in which the residual VOC in the freshly molded cups is added to the total amount of VOC that escaped until the cups emerged from the molds. The Department is asking for comment on the appropriate emission level within this range in this proposal.

6. Demonstration of compliance with A.R.S. § 49-112:

Under A.R.S. § 49-112(A), Maricopa County may adopt rules that are more stringent than or in addition to a provision of the state, provided that the rule is necessary to address a peculiar local condition; and if it is either necessary to prevent a significant threat to public health or the environment that results from a peculiar local condition and is technically and economically feasible; or if it is required under a federal statute or regulation, or authorized pursuant to an intergovernmental agreement with the federal government to enforce federal statutes or regulations if the county rule is equivalent to federal statutes or regulations; and if any fee adopted under the rule will not exceed the reasonable costs of the county to issue and administer that permit program. Maricopa County is in compliance with A.R.S. § 49-112(A) in that Maricopa County proposes to adopt new Rule 358 that is more stringent than a provision of the state in order to meet the requirements of Sections 182(b)(2)(C) and 182(c) of the Clean Air Act. These statutes require states with ozone nonattainment areas to submit revision requiring implementation of reasonably available control technology with respect to all major sources of VOCs that are located in the area. Maricopa County is designated as a serious non-attainment area for ozone, carbon monoxide and particulate matter at 10 microns. Maricopa County is the only ozone nonattainment county in Arizona.

7. A reference to any study relevant to the rule that the department reviewed and either proposes to rely on in its evaluation of or justification for the rule or proposes not to rely on in its evaluation or justification for the rule; where the public may obtain or review the study, all data underlying each study, any analysis of the study, and other supporting material:

1. Draft RACT Analysis for Expandable Polystyrene Foam Product Manufacturing, Maricopa County Department of Environmental Quality, November 2003.
2. Control of VOC Emissions from Polystyrene Foam Manufacturing (EPA-450/3-90-020), September 1990.
3. EPA Air Pollution Control Cost Manual – Sixth Edition (EPA 450/B-02-001), January 2002

8. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision:

Not applicable

9. The preliminary summary of the economic, small business and consumer impact:

There will be some costs to Maricopa County due to the projected costs that accrue for implementation and enforcement of the new standards. This preliminary economic statement (EIS) was developed to estimate the impact of the rule. This impact statement, comprised of potential costs and benefits, represents an estimate. Maricopa County solicits input from sources that could be small businesses and organizations on the administrative and other costs required for compliance with the proposed rulemaking, and any other information relevant to the economic, small business and consumer impact statement.

Maricopa County has identified four facilities that expand polystyrene (EPS) to make foam products, each of whose uncontrolled VOC emissions exceed the major source threshold, 50 tons per year. Two of these facilities are Title V sources that expect to continue to emit more than 50 tons per year, even when controlling VOC emissions according to this rule. In addition, two of the facilities recently installed new VOC-control devices. These two facilities provided information to the Department on actual costs for the new systems they installed. The Department used the actual costs to calculate cost effectiveness consistent with the methodology described in EPA Air Pollution Control Cost Manual – Sixth Edition (EPA 452/B-02-001), January 2002. The companies reported spending between \$300,000 and \$570,000 which calculates to a cost effectiveness of \$1800 to \$3500 per ton of VOC reduced.

In September 1990 EPA published a document entitled Control of VOC Emissions from Polystyrene Foam Manufacturing (EPA-450/3-90-020). Updating the cost effectiveness numbers from those calculations to 2003 dollars results in the values provided in the Table 1 below.

Table 1

Table based on EPA Table 7-7. IN 2003 DOLLARS COST EFFECTIVENESS (\$/TON) AT 50, 60, 75, and 81 PERCENT EFFICIENCIES EPS MODEL FACILITIES								
Plant 'size' = tons of EPS beads/yr	<u>Carbon Adsorption</u> <u>with 90% abatement efficiency*</u>				<u>Thermal Incineration</u> <u>with 98% abatement efficiency and 70%</u> <u>thermal efficiency</u>			
	Capture Efficiency				Capture Efficiency			
	50%	60%	75%	81%	50%	60%	75%	81%
1500	\$5,920	\$4,928	\$4,026	\$3,731	\$12,188	\$10,249	\$7,962	\$7,252
3000	\$3,508	\$2,975	\$2,501	\$2,342	\$8,954	\$7,400	\$5,890	\$5,410
4500	\$2,464	\$2,079	\$1,806	\$1,711	\$7,814	\$6,490	\$5,121	\$4,689
* Includes credit for heat value of recovered pentane								
***"EPS Model Facilities" means these are hypothetical models and not based on actual VOC-control systems in EPS block facilities when the research was performed for the 1990 EPA publication.								

10. The name and address of department personnel with whom persons may communicate regarding the accuracy of the economic, small business and consumer impact statement:

Name: Rick Kramer-Howe or Jo Crumbaker, Air Quality Division
 Address: 1001 N. Central Avenue, Suite 695
 Phoenix, AZ 85004
 Telephone: (602) 506-6706 or (602) 506-6705
 Fax: (602) 506-6179
 E-mail: rkramer@mail.maricopa.gov or jcrumbak@mail.maricopa.gov

11. The time, place, and nature of the proceedings for the making, amendment, or repeal of the rules:

Written comments will be accepted if received between the date of this publication and Friday December 12, 2003, 5:00 p.m. Written comments may be mailed or hand delivered to the Maricopa County Environmental Services Department (see item #4 above). Written comments received during the comment period will be considered formal comments to the proposed rules and will be responded to in the Notice of Final Rulemaking.

An oral proceeding will be held Thursday December 11, 2003 at 10:00 a.m. at the Maricopa County Environmental Services Department, Suite 560 (see item #4 above). All comments made at this oral proceeding will be considered formal comments and will be recorded and transcribed. All formal comments will be addressed in the Notice of Final Rulemaking.

12. Any other matters prescribed by statute that are applicable to the specific department or to any specific rules or class of rules:

None

13. Incorporations by reference and their location in the rules:

New incorporations by reference

Location

Bay Area Air Quality Management District,
 BAAQMD Manual of Procedures,
 Method 45, Volume III

Section 503.2

South Coast Air Quality Management,
 AQMD Method 25.3

Section 503.3(c)

EPA Test Method 204a,b,c,d,e and f
40 C.F.R. 51, Appendix M

Section 503.5(b)(1)

Incorporations by reference updated to 7/1/02

Location

40 C.F.R. 60, Appendix A

Section 504

14. The full text of the rule follows:

REGULATION III - CONTROL OF AIR CONTAMINANTS

RULE 358

POLYSTYRENE FOAM OPERATIONS

INDEX

SECTION 100 - GENERAL

101 PURPOSE

102 APPLICABILITY

SECTION 200 - DEFINITIONS

201 BLOCK (EPS FOAM BLOCK)

202 BLOWING AGENT

203 CUP MOLDING

204 DAY

205 EMISSION CONTROL SYSTEM (ECS)

206 EPS BEAD (EXPANDABLE POLYSTYRENE BEADS)

207 EPS FOAM (EXPANDED POLYSTYRENE FOAM)

208 EXPANSION DAY

209 IMBM VOC CONTENT

210 MCBL VOC CONTENT

211 NONPRECURSOR ORGANIC COMPOUND

212 PERMANENT TOTAL ENCLOSURE

213 PMLT VOC CONTENT

214 POLYSTYRENE

215 PREPUFF

216 SHAPE

217 SPENT PREPUFF

218 VOLATILE ORGANIC COMPOUND (VOC)

219 VOC CONTENT OF RAW EPS

SECTION 300 - STANDARDS

301 EPS BLOCK-MAKERS

- 302 SHAPE MAKERS
- 303 CUP MAKERS
- 304 CONTROL OF PREPUFF EMISSIONS FOR BLOCKS AND SHAPES
- 305 PERFORMANCE OF ECS CONTROLLING VOC EMISSIONS
- 306 OPERATION AND MAINTENANCE (O&M) PLANS
- 307 PROCESSING AND MONITORING
- 308 VOC CONTAINMENT, IDENTIFICATION, AND DISPOSAL
- 309 EXEMPTIONS AND EXCEPTION

SECTION 400 – ADMINISTRATIVE REQUIREMENTS

- 401 COMPLIANCE SCHEDULE

SECTION 500 – MONITORING AND RECORDS

- 501 RECORDS
- 502 RECORDKEEPING SPECIFICS
- 503 TESTING PROCEDURES
- 504 TEST METHODS ADOPTED BY REFERENCE

MARICOPA COUNTY

AIR POLLUTION CONTROL REGULATIONS

REGULATION III - CONTROL OF AIR CONTAMINANTS

RULE 358

POLYSTYRENE FOAM OPERATIONS

SECTION 100 – GENERAL

- 101 **PURPOSE:** The purpose of this rule is to limit the emissions of volatile organic compounds (VOCs) from the manufacturing of expanded-polystyrene products.

- 102 **APPLICABILITY:** This rule applies to any facility that expands expandable polystyrene (EPS).

SECTION 200 – DEFINITIONS: For the purpose of this rule, the following definitions shall apply. See Rule 100 (General Provisions And Definitions) of these rules for definitions of terms that are used but not specifically defined in this rule.

- 201 **BLOCK (EPS FOAM BLOCK)** – A block-shaped solid made of EPS foam that was molded as a unit and typically has a depth and width each exceeding 23 inches (0.6 M) and a length exceeding 95 inches (2.4 M).
- 202 **BLOWING AGENT** – Any substance that, alone or in conjunction with other substances, is capable of producing a cellular (foam) structure in a polymeric material by inflation.
- 203 **CUP MOLDING** – The process of making cups, bowls, and similar containers by molding expanded polystyrene globules (prepuff).
- 204 **DAY** - Any 24-hour period beginning at 12:00 AM, midnight.

- 205** **EMISSION CONTROL SYSTEM (ECS)** – A system for reducing emissions of volatile organic compounds, consisting of a capture system and control device(s).
- 206** **EPS BEADS (EXPANDABLE POLYSTYRENE BEADS)** – Polystyrene beads or granules, usually less than one-twelfth inch in diameter, that are formulated with a blowing agent (typically 3% to 7% of bead mass). When subjected to prescribed heating, the beads puff up, expanding many times their original volume into low density foam globules (called “prepuff” or “puff”) from which a variety of EPS foam products are molded.
- 207** **EPS FOAM (EXPANDED POLYSTYRENE FOAM)** – A lightweight, naturally white, foam material – made of polystyrene – from which a variety of popular items are made, such as insulation board, protective packaging material, and disposable cups.
- 208** **EXPANSION-DAY** – Any day during which a facility expands EPS raw materials.
- 209** **IMBM VOC CONTENT** - See “VOC CONTENT OF RAW EPS”.
- 210** **MCBL VOC CONTENT** – See “VOC CONTENT OF RAW EPS”.
- 211** **NONPRECURSOR ORGANIC COMPOUND** – Any of the organic compounds that have been designated by the EPA as “exempt” (having negligible photochemical reactivity). A listing of the compounds is found in Rule 100 of these rules and regulations.
- 212** **PERMANENT TOTAL ENCLOSURE** – A permanently installed enclosure that meets all of the requirements of a “permanent total enclosure” in EPA Method 204, referenced in Section 504 of this rule.
- 213** **PMLT VOC CONTENT** – See “VOC CONTENT OF RAW EPS”.
- 214** **POLYSTYRENE** – Any grade, class, or type of thermoplastic polymer, alloy, or blend that is composed of at least 50% polymerized styrene, by mass.
- 215** **PREPUFF** – Expanded polystyrene globules, prior to molding, formed from EPS beads/granules that have been processed in an expander. No “regrind” material (i.e., that has been through a grinder) or material within a “regrinding” system is prepuff.
- 216** **SHAPE** – An object made out of EPS that has been molded into a shape other than that of a block, cup, or bowl.
- 217** **SPENT PREPUFF** - Prepuff that has lost so much VOC that it cannot by itself be molded.
- 218** **VOLATILE ORGANIC COMPOUND (VOC)** – Any organic compound that participates in photochemical reactions, except nonprecursor organic compounds.
- 219** **VOC CONTENT OF RAW EPS** – For the purposes of this rule, there are 3 different expressions for the VOC content of raw EPS beads/granules. Each of these expressions must be made in terms of either percentage of overall mass (including the VOC mass) that the incorporated VOC constitutes or pounds of VOC per 100 pounds of beads. Percentage shall be expressed with a precision of at least the nearest tenth of one percent, which is equivalent to pounds VOC per 100 lbs. beads to the nearest tenth of a pound. The 3 acceptable expressions are:
- 219.1** **ISO-Certified Maximum Bead-Model (IMBM) VOC Content**– An expression of the upper limit

of a particular bead-model's VOC-content, as stipulated to by a bead-model's manufacturer that is certified for accurate VOC content expression by the International Standards Organization (ISO).

219.2 Manufacturer-Certified Bead-Lot (MCBL) VOC Content – A document that numerically presents an EPS bead-lot's VOC content and that has all of the following context:

- a.** The VOC content is printed or written on a paper document by the bead manufacturer, after the manufacturer has had the lot tested to determine the lot's percent VOC, before shipping from the manufacturer;
- b.** The bead-lot and manufacturer's name is identified on the paper document using appropriate code-labeling; and
- c.** The document is signed by an officer of the manufacturing facility.

219.3 Post-Manufacture Laboratory-tested VOC Content (PMLT VOC Content): The results of a laboratory test determining the VOC content of a representative sampling of an intermediate or finished expanded polystyrene-product, or such a test of raw beads any time after their MCBL VOC content has been assigned.

SECTION 300 – STANDARDS: Compliance with those provisions of Sections 301 through 303 of this rule that require emission testing shall be determined by applicable test methods that are listed in Section 503 and incorporated by reference in Section 504 of this rule.

301 EPS BLOCK-MAKERS: An operator of an EPS block-making facility shall either operate an ECS and conduct the manufacturing process to comply with both Sections 301.1 and 301.2 of this rule; or comply with Section 302.3 of this rule.

301.1 Including capture and control, achieve at least 81% overall reduction of VOC emitted from all operations that occur, starting with the opening of the bead packaging and ending with the completed release of the block from the mold; and

301.2 For every period of 30 consecutive calendar days, the average VOC content of raw expandable polystyrene shall not exceed 5.0% VOC by mass. Use the following formula to calculate the average VOC content, with P equal to 30:

FORMULA #1

$$\text{VOC}_P = \frac{\sum_{j=1}^n [M \times C]}{\sum_{j=1}^n M} \times 100 \leq 5.0$$

where:

P = Current or most recently completed expansion day and the (P – 1) consecutive calendar days previous to it.

VOC_P = The weighted average percent VOC CONTENT of all “n” batches of beads expanded during the averaging period, P, throughout the facility, expressed in percent VOC by mass.

n = The total number of different bead lots expanded during period, P. If there are 2 or more identifiable sub-lots from the same lot, each of which has a different VOC CONTENT, then each such subplot shall be treated as separate lot when using the formula.

C = The VOC CONTENT of the jth bead lot used during the reporting period, P, expressed as a fraction (e.g., in lbs. VOC per 1 lb. of beads).

M = The total mass of the jth bead lot used during the reporting period, P, expressed in lbs. of beads.

301.3 In the processing and aging areas, including expansion and molding, have and use only raw beads with a VOC content not exceeding 3.0%, and have no prepuff derived from beads that contained more than 3.0% VOC. If the Control Officer allows an owner and/or operator to alternate complying with this section with complying with Sections 302.1 and 302.2 of this rule, the following requirements apply:

- a. The mass and VOC content values of the beads used to comply with the Section 301.3 alternative operating scenario shall not be included when averaging bead VOC content, as required to comply with the Section 301.2 alternative operating scenario.
- b. Section 301.2 of this rule and the definition for "P" shall refer to 30 sequential calendar days that do not include any Section 301.3 alternative operating scenario expansion days.

302 **SHAPE MAKERS:** The operator of an EPS shape-making facility shall either operate an ECS and conduct the manufacturing process to comply with both Sections 302.1 and 302.2 of this rule; or comply with Section 302.3 of this rule:

302.1 Including capture and control, achieve at least 85% reduction of the entire mass of VOC emitted from all the operations from the point of opening the bead-packaging through the point that the prepuff reaches the molding machines; and

302.2 Comply with either Section 302.2(a) or 302.2(b) of this rule, below:

- a. Limit VOC Content of raw beads to not more than 4.8% VOC by mass; or
- b. Limit the weighted, rolling 30-day average of VOC content to not more than 4.6% VOC according to Formula #2, with P equal to 30. The symbols and factors used in formula #2 have the same meaning as the symbols and factors used in formula #1 of this rule.

FORMULA #2

$$\text{VOC}_P = \frac{\sum_{j=1}^n [M \times C]}{\sum_{j=1}^n M} \times 100 \leq 4.6\%$$

302.3 In the processing and aging areas, including expansion and molding, have and use only raw beads with a VOC content not exceeding 3.0%, and have no prepuff derived from beads with more than 3.0% VOC. If the Control Officer allows an owner and/or operator to alternate complying with this section with complying with Sections 302.1 and 302.2 of this rule, the following requirements apply:

- a. The mass and VOC content values of the beads used to comply with the Section 302.3 alternative operating scenario shall not be included when averaging bead VOC content, as required to comply with Section 302.2 alternative operating scenario.
- b. Section 302.2 and the definition for "P" shall refer to 30 sequential calendar days that do not include any Section 302.3 alternative operating scenario expansion days.

303 **CUP MAKERS:** An operator of an EPS cup-making facility shall either operate an ECS and conduct the manufacturing process to comply with both Sections 303.1 and 303.2 of this rule or comply with Section 303.3 of this rule.

303.1 **VOC Reduction Until Beads Reach Molding Machines:** Including capture and control, achieve at least an 85% overall reduction of VOC emitted, from the point of opening of the bead-packaging through the point that the prepuff reaches the molding machines; and

303.2 **Emission Limit:** For every 100 pounds of beads processed, not more than 1.5 pounds of VOC shall escape to atmosphere between the time that the bead packaging is opened and the time the cups made from the beads are released from their molds;

303.3 Limit the sum of the mass of VOC emitted plus the mass of VOC retained in all molded cups to no more than 3.0 – 3.9 lbs. of VOC per 100 lbs. of raw beads.

- 304 CONTROL OF PREPUFF EMISSIONS FOR BLOCKS AND SHAPES:**
- 304.1** Control devices shall be operated to control prepuff VOC emissions from whatever prepuff is present, except as otherwise allowed in Section 304.2 of this rule:
- 304.2** Exceptions to Section 304.1: The ECS and/or the ECS's control device is allowed to be inoperative when prepuff is present at an EPS facility under the following conditions:
- a.** The prepuff no longer contains enough VOC to be molded and meets both of the following requirements:
- (1)** Emissions from the prepuff are controlled by the ECS until the prepuff VOC content is equivalent to the VOC content of EPS material exiting the molding machine. This period of time shall be determined as follow:
- (i)** Prepuff made from raw beads with a VOC content of 3.6% or less shall be controlled until sent to the molding machine or for at least 16 hours.
- (ii)** Prepuff made from raw beads with a VOC content greater than 3.6% shall be controlled until sent to the molding machine for at least 16 hours plus an additional hour for each 1/10 percent VOC content in the raw bead above 3.6%.
- (2)** The prepuff is designated unmoldable by either labeling the prepuff container or entering a notation on the production board for the prepuff container.
- b.** Periods allowed when the Control Officer approves a written waiver of the requirements of Section 304.1 of this rule that meets all of the following requirements:
- (1)** All prepuff is kept confined within a permanent enclosure that is operated and maintained to comply with operational parameters measured during the most recent performance test;
- (2)** A protocol for testing the enclosure while the ECS is not operating has been submitted and approved by the Control Officer and the Administrator; and
- (3)** The facility conducts performance tests annually to demonstrate permit compliance according to the approved protocol.
- 305 PERFORMANCE OF ECS CONTROLLING VOC EMISSIONS:** If an ECS is required by this rule, the processing (abatement) subsystem of such ECS shall reduce both of the following:
- 305.1** The weight of VOC-as-carbon delivered to it by at least 94% for inlet concentrations greater than or equal to 1.0 gram carbon/meter³; and
- 305.2** The concentration of VOC-as-carbon to not more than 60 mg. carbon/meter³ when inlet concentration is less than 1.0 gram carbon/meter³.
- 306 OPERATION AND MAINTENANCE (O&M) PLANS:**
- 306.1** An owner and/or operator shall provide, implement, and maintain an O&M Plan for each ECS, for any other emission processing equipment, and for any ECS monitoring devices that are used according to this rule.
- 306.2** The owner and/or operator shall submit to the Control Officer for approval the O&M Plans of each ECS and each ECS monitoring device that is used according to Sections 301, 302, or 303 of this rule (such as for the provision and maintenance of a continuous temperature recorder for an oxidizer's combustion chamber or for a condenser's outlet duct, or of a permanent total-enclosure's negative pressure gauge(s), etc.).
- 306.3** The O&M Plan shall include limits on the production characteristics that correlate with the operating parameters established for the ECS during the applicable performance test that demonstrated compliance with this rule. For example, such limits typically would include the throughput, the bead model, and the product type produced.
- 306.4** An owner and/or operator of an EPS facility must comply with all O&M Plans that the owner or operator has submitted for approval but which have not yet been approved, unless notified otherwise by the Control Officer in writing.
- 307 PROCESSING AND MONITORING:**
- 307.1** **Process Equipment:** An owner or operator must operate and maintain process equipment in which VOC-containing materials are used in a manner consistent with good air pollution control practices for minimizing emission, at least to the levels required by this rule.
- 307.2** **Installing and Maintaining ECS Monitoring Devices:** Any person incinerating, adsorbing, or otherwise controlling VOC emissions according to this rule shall properly install, operate and maintain in calibration and in good working order ECS-monitoring devices described in the facility's O&M Plan. Typical devices indicate temperature, pressure, flow rate, and/or other functions correlated with proper functioning of VOC-reduction equipment. Records shall be kept according to Section 500 of this rule.

308 VOC CONTAINMENT, IDENTIFICATION, AND DISPOSAL:

308.1 Store all fresh and used VOC-containing material in closed, leak-free, labeled containers when not in use. Such materials include but are not limited to raw beads, cleaning solvents, inks, coatings, thinners, and their residues including residues on rags.

308.2 Materials addressed in Section 308.1 of this rule may be placed in an enclosure ducted solely to an ECS that is approved by the Control Officer, instead of in closed containers.

308.3 The owner and/or operator must implement procedures to minimize spills of VOC-containing materials described in section 308.1 of this rule, during their handling and transfer to or from containers, vats, enclosed systems, waste receptacles, and other equipment, whether the material is fresh, used, or waste.

308.4 Identification and Labeling:

a. Containers used for initial, intermediate, or final storage of VOC-containing materials addressed in section 308.1 of this rule shall be clearly labeled with their contents.

b. Content-labeling done according to the requirements of federal hazardous waste (RCRA) or occupational safety (OSHA) statutes and codes meets the requirements in section 308.4(a) of this rule.

308.5 **EPS Scrap and Spent Prepuff:** A facility is not required to control VOC emissions either from EPS after it is molded or from properly labeled spent-prepuff that is diverted as scrap or waste. A facility is not required to confine either material in leak-free containers.

309 EXEMPTIONS AND EXCEPTION:

309.1 **De minimis Exemption from Sections 301.1 through 306.4:** To obtain a de minimis exemption from the requirements of Sections 301.1 through 306.4 of this rule, an owner or operator must:

a. Have submitted an emissions inventory each calendar year as required by Maricopa County Environmental Services Department (MCESD) and

b. Meet all the requirements of either sections 309.1(b)(i) or 309.1(b)(ii):

(1) The facility has not expanded more than 1,429,000 lbs. of raw beads during any year; or

(2) For every lot of raw EPS used by the facility during each year, the facility has complete records of the lots' weight; and

(i) Either a record of the lot's VOC content or an assignment by the facility of a 7.0% default value to lots for which the VOC content value is missing; and

(ii) The aggregate sum of the products (percent-VOC times weight) of all lots that were expanded was less than 12,000 lbs. in any calendar month and less than 100,000 lbs. in any calendar year.

309.2 **Burden of Proof:** A person claiming any exemption from this rule or from a provision of this rule shall provide adequate records to verify and maintain any exemption. These may include records of raw material used, laboratory analyses, technical data sheets, and/or performance test results.

SECTION 400 - ADMINISTRATIVE REQUIREMENTS

401 **COMPLIANCE SCHEDULE:** A person or owner/operator of a facility that is subject to Sections 301, 302, or 303 of this rule shall comply with the following increments of progress:

401.1 By (date 4 months after date of adoption), the owner or operator either must submit an application or have been issued a revised permit that addresses the installation and operation of the equipment to be used to achieve compliance with this rule.

401.2 By (date, 12 months after date of adoption), the owner or operator must complete the installation of all equipment required to meet the provisions of this rule.

401.3 By (date, 18 months after date of adoption) the owner or operator must comply with the standards in Sections 301, 302, and 303 of this rule.

SECTION 500 - MONITORING AND RECORDS

501 RECORDS:

501.1 **General:** Records shall be kept complete and up-to-date, in a consistent and legible format.

501.2 **Retention:** Required records shall be retained for at least 5 years.

501.3 **Use of Other Records:** Records that are kept by a facility for other agencies or purposes may be submitted to meet the record requirements of this rule, provided they contain the necessary information according to Section 502 of this rule.

502 RECORDKEEPING SPECIFICS:

502.1 **Tracking EPS Beads:** Effective [date: 3 months after adoption], a person subject to this rule shall comply with the following requirements, as applicable.

- a. **Lot ID and VOC Content:** An owner and/or operator shall obtain and retain an original or copy of the manufacturer-certified bead-lot (MCBL) VOC content or PMLT VOC-content for each lot-number of beads received, prior to expanding any of the lot.
- b. **Total Expanded, By Lot and Date:** An owner and/or operator shall maintain records each day of the total weight of each bead-lot expanded, and keep entries in chronological order.
- c. **Block makers shall keep, in chronological order, a record of blocks made each day, according to one of the following:**
 - (1) For each block before it leaves the molding machine area, make entries for its approximate weight, the bead lot designation, and the date;
 - (2) By each bead-lot, each day enter the day's total weight of blocks made from that lot, and the date; or
 - (3) By each bead-lot, each day enter the weight of each block made from that lot, and the date.
- d. **Calculate 30-Day Rolling Average:**
 - (1) Block-makers that are subject to Section 301 of this rule and use beads exceeding 5.0% VOC content shall maintain a list, in chronological order, of each expansion-day's 30-day average VOC-content, calculated and entered each expansion-day according to the formula in Section 301.2 of this rule.
 - (2) Shape makers that are subject to Section 302 of this rule and use beads exceeding 4.6% VOC content shall maintain a list, in chronological order, of each expansion-day's 30-day average VOC-content, calculated and entered each expansion-day according to the formula in Section 302.2 of this rule.

502.2 Lists of Non-EPS VOC-Containing Materials: Non-EPS materials may include, but are not limited to, the following categories: inks, coatings, adhesives, reducers, thinners, solvents, cleaning materials, additives, spray-cans, sprayed lubricants, and any other VOC-containing materials.

- a. An owner and/or operator shall maintain a current list of non-EPS materials, containing VOC, used at the facility. A complete and ordered assemblage of the required data meets the requirements for a list.
- b. An owner and/or operator shall express VOC content in one of the following three forms:
 - (1) Pounds VOC per gallon (or grams VOC per liter).
 - (2) Fractional pounds of VOC per lb. material (or grams per kilogram), or
 - (3) The percent VOC by weight along with the specific gravity or density (2 numbers are required).

502.3 On a daily basis, the owner and/or operator of a facility that operates an ECS to comply with this rule shall record key system operating parameters such as temperature, flow rate, and pressure.

503 TESTING PROCEDURES: An owner and/or operator will be in violation of this rule if the VOC emissions, measured by any of the referenced test methods specified in this section and listed in Section 504 of this rule, exceed the standards in Section 300 of this rule.

503.1 An owner and/or operator shall perform the measurement of airflow and gas flow into and out of the ECS by performing EPA Method 2, referenced in section 504.1 of this rule.

503.2 An owner and/or operator shall perform the measurement of gas streams containing both VOC and non-VOC organic vapors by performing EPA Method 18, referenced in section 504.2 of this rule.

503.3 An owner and/or operator shall determine the control efficiency of the VOC processing (abatement) subsystem of an ECS by performing EPA Method 25 or 25A, referenced in Section 504.4 of this rule, or the South Coast Air Quality Management District Method 25.3, referenced in Section 504.7 of this rule.

503.4 An owner and/or operator shall determine the efficiency of a capture system according to both EPA Method 204 (and its submethods) referenced in Section 504.5 and the EPA guidance document referenced in Section 504.8 of this rule.

503.5 An owner and/or operator shall determine the concentration of low concentration non-methane, non-ethane organic compound emissions from clean fueled combustion sources by performance of South Coast Air Quality Management District Method 25.3 as referenced in Section 504.7 of this rule.

503.6 An owner and/or operator shall determine the concentration of total volatile organic carbon content in polymeric materials by performing Bay Area Quality Management District (BAAQMD) Method 45 as referenced in Section 504.6 of this rule.

503.7 **Determining Compliance with Section 303.2:** For determination of compliance with the standard in Section 303.2 of this rule, samples from a representative cross-section of cup-types shall be taken according to Sections 503.8(a) through 503.8(d) of this rule.

- a.** At the time of each sampling run, prepuff, fresh cups, and beads in production shall all be from the same bead-lot.
- b.** Determine VOC-content of the raw beads from the same lot as the cups to be sampled by a statistical sampling from the bead containers before they are opened or within 10 minutes after their initial opening. Sampled containers (e.g., gaylords) shall be resealed if they are not used right after sampling, until their contents are processed.
- c.** All cup samples of the range of cup types sampled shall be collected within no more than 60 consecutive minutes, (i.e. there will be a single start time (St) that applies to the sampling of the full range of cup types. No sample taken after St + 60 minutes is acceptable).
- d.** Both the VOC-reduction efficiency established by the most recent performance test establishing compliance with Section 303.1 of this rule and the VOC content of the raw beads of the sampled lot shall be used in determining compliance with 303.2 of this rule.

503.8 **Determination of ECS Effectiveness:**

- a.** The primary method of determining ECS effectiveness shall be by deduction from a testing protocol based on mass balance, calculated according to the following formulas.

$$\% \text{ CAPTURE} = \frac{\text{VOC}_{\text{ECS}}}{\text{VOC}_I - \text{VOC}_P}$$

$$\% \text{ CONTROL} = \frac{\text{VOC}_{\text{ECS}} - \text{VOC}_{\text{St}}}{\text{VOC}_{\text{ECS}}}$$

$$\% \text{ EMITTED} = \frac{\text{VOC}_I + \text{VOC}_{\text{St}} - \text{VOC}_P - \text{VOC}_{\text{ECS}}}{\text{VOC}_I - \text{VOC}_P}$$

$$\% \text{ OVERALL (Capture+Control)} = \frac{\text{VOC}_{\text{ECS}}}{\text{VOC}_I - \text{VOC}_P} * \frac{\text{VOC}_{\text{ECS}} - \text{VOC}_{\text{St}}}{\text{VOC}_{\text{ECS}}}$$

Where VOC_I is the VOC input in the form of the VOC content of a weighed mass of raw beads.

VOC_P is the VOC content of the products made from the weighed raw beads.

VOC_{ECS} is the VOC measured in the air entering the ECS while processing the beads into product.

VOC_{St} is the VOC remaining in the gas stream(s) emerging from the ECS while processing the beads.

503.9 **Conforming Testing to Desired Production Characteristics:** The owner and/or operator of an EPS facility must, through performance testing, demonstrate compliance with each alternative operating scenario chosen.

504 **TEST METHODS ADOPTED BY REFERENCE:** The EPA test methods as they exist in the Code of Federal Regulations (C.F.R.) on July 1, 2003, are adopted by reference. These adoptions by reference include no future editions or amendments. Copies of test methods referenced in this Section are available at the Maricopa County Environmental Services Department, 1001 North Central Avenue, Phoenix, AZ, 85004-1942. The other test methods from Bay Area Air Quality Management District and South Coast Management District listed herein are also adopted by reference, each having paired with it a specific date that identifies the particular version/revision of the method that is adopted by reference.

504.1 EPA Reference Method 2 ("Determination of Stack Gas Velocity and Volumetric Flow Rate"), 2a ("Direct Measurement of Gas Volume Through Pipes and Small Ducts"), 2c ("Determination of Stack Gas Velocity and Volumetric Flow Rate in Small Stacks or Ducts"), and 2d ("Measurement of Gas Volumetric Flow Rates in Small Pipes and Ducts"), (40 C.F.R. 60, Appendix A).

- 504.2** EPA Reference Method 18 (“Measurement of Gaseous Organic Compound Emissions by Gas Chromatography”), (40 C.F.R. 60, Appendix A).
- 504.3** EPA Reference Method 21 (“Determination of Volatile Organic Compound Leaks”),(40 C.F.R. 60 Appendix A).
- 504.4** EPA Reference Method 25(“Determination of Total Gaseous Nonmethane Organic Emissions as Carbon”), and Method 25A (“Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer”), (40 C.F.R. 60, Appendix A).
- 504.5** EPA Reference Method 204 (“Criteria for Determining Capture Efficiency”), 204A, 204B, 204C, 204D (“Volatile Organic Compounds Emissions in Uncaptured Stream from Temporary Total Enclosure”), 204E (“Volatile Organic Compounds Emissions in Uncaptured Stream from Building Enclosure”), and 204 F (“Volatile Organic Compounds Content in Liquid Input Stream (Distillation Approach)”) (40 C.F.R. 51, Appendix M).
- 504.6** Bay Area Air Quality Management District (BAAQMD) Method 45 (“Determination of Butanes and Pentanes in Polymeric Materials”), (BAAQMD Manual of Procedures, Volume III, 2000).
- 504.7** South Coast Air Quality Management District (AQMD) District Method 25.3 (“Determination of Low Concentration Non -Methane, Non- Ethane Organic Compound Emissions from Clean Fueled Combustion Sources.” Monitoring and Engineering Branch, Monitoring and Analysis, March 2000).
- 504.8** EPA Guidance Document, *Guidelines for Determining Capture Efficiency*, January 9, 1995.